

REMARKS/ARGUMENTS

Applicants have carefully reviewed the Final Office Action of November 21, 2005. Reconsideration of the Examiner's rejection of the claims is respectfully requested. A Request for Continued Examination (RCE) is being filed in order to continue examination of this case.

A total of 11 claims remain in the case, i.e. claims 1, 2, 18, 20-23, 25-26 and previously submitted claim 48. Independent claim 1 is currently amended to delete the word "essentially" in an effort to eliminate the indefiniteness rejection of the claims.

Claims 7, 19, 24, 27 and 28 were canceled, claims 2, 20 and 29 were amended, and the remaining claims 3-6, 8-17, and 30-47 were withdrawn in the previous amendment of September 22, 2005. Previously presented claim 48 recites that the polyethylene wax has a particle size ranging from 6 to 60 microns and an average molecular weight of 1,000. Claims 21-23, and 25-26 remain as originally filed.

Election/Restriction

Applicants note that the restriction requirement is still deemed proper and is therefore made final. Applicants have withdrawn these claims 3-6, 8-17 and 30-47 from further consideration under 37 CFR 1.142 (b), as being drawn to non-elected inventions. The inventorship of the elected claims 1, 2, 7 and 18-29 and previously presented claim 48 remain as originally submitted.

Claim Rejection under 35 U.S.C. 112

Claims 1, 2, 18, 20-23, 25, 26, 29 and 48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the

invention. Claim 1 is currently amended to eliminate the term "essentially" in order to overcome this indefiniteness rejection.

In view of this amendment to claim 1, Applicants request that the rejection of the claims on this basis be withdrawn.

Claim Rejections Under 35 U.S.C. 102(b)

Claims 1, 2, 18, 20-23, 25, 26, 29 and 48 are rejected under 35 U.S.C. 102 (b) as being anticipated by Brenner et al. (WO 00/50511). The Examiner refers Applicants to column 9, lines 45-53 and column 12, line 37 to column 13 line 22 of U.S. Patent No. 6,740,697 which is the English language version of WO 00/50511. This reference is said to teach thermoplastic resin particles coated with up to 20% of a composition and comprising an antistatic, such as polyethylene glycol, a lubricant such as polyolefin wax, and a mold release agent such as zinc stearate, each in amounts up to 20% by weight, based on the thermoplastic resin. The Examiner states that in view of these teachings, the requirements for rejection are met.

The Invention

The claimed invention relates to a coating composition for thermoplastic resin particles, such as expandable polystyrene particles (ESP). Claim 1 in its present state recites thermoplastic resin particles coated with a coating composition. This coating composition is comprised of a liquid part and a solid part where the liquid part comprises a) polyethylene glycol having an average molecular weight from 200 to 800; and the solid part comprises b) a polyolefin wax, and c) a metal salt of higher fatty acids selected from the group consisting of zinc, magnesium, calcium, and aluminum salts of stearic,

lauric and myristic acid. The polyolefin wax of component b) is polyethylene wax with a particle size of about 6 microns to about 140 microns and an average molecular weight of about 650 to about 30,000.

As stated in the amendment of September 22, 2005, an important patentable distinction of the invention as recited in claim 1 is that the wax is polyethylene wax with a particle size ranging from about 6 microns to about 140 microns with an average molecular weight of 650 to about 30,000. Support for these features appears on page 16 of the specification and in the Examples. Previously presented claim 48 recites that the polyethylene wax has a particle size of about 6 to 60 microns and an average molecular weight of 1,000. Support for these features appear on page 17 of the specification and in the Examples.

As taught on page 12, lines 8-10 of the specification, the particles of the invention are in the form of beads, granules, or other particles convenient for the expansion and molding operations. As taught on page 14, lines 21 - 36, these particles can either be expandable, impregnated thermoplastic particles or they can be pre-expanded impregnated thermoplastic particles which are coated or covered first with the liquid polyethylene glycol and then with the two solid components of the coating composition. These thermoplastic particles, which may be expandable polystyrene (EPS), are already formed through a suspension polymerization process and contain a blowing agent that is incorporated in the polymerization process, and then are coated with the coating composition. These coated or covered particles are then placed in a mold having the shape of the article, e.g. cup, bowl, and through a molding process and the use of steam, heat, etc. the particles are molded into the shape of an article, e.g.

cup, bowl. Claim 26 recites that the components of the solid part of the coating components are dry mixed together and then dry blended with the thermoplastic particles. The dry blended components are applied to the outer surface of the formed particles as a coating or covering after the liquid component is applied to the surface.

As page 9 of the specification states, the term "coat" means to contact with a coating composition so as to place a substantial portion of the components of the coating composition on or near the surface or surfaces of the resin particles. The term "cover" means the form in which the coating composition adheres in layers on the surface of the particles.

Page 20, lines 10 -15 of the specification, teach that preferably, the entire surface of the thermoplastic resin particles is to be coated or covered with a thin film or layer, and that in some instances it may be adequate that only a portion of the surfaces of the particles be coated or covered with the coating composition of the invention.

In the examples of the invention it is shown that expandable polystyrene beads were first blended with the liquid polyethylene glycol in a drum mixer. These beads were then stir blended with the remaining components of the coating composition in the drum mixer.

The coating composition of the claimed invention not only improves the resistance to leakage of any article, e.g. cup or bowl, that may be formed from the thermoplastic resin particles, but the type of wax, which is polyethylene wax having the claimed particle size and average molecular weight, also improves the mechanical properties of the article produced from the coated particles. That is, the overall strength (ATF) and/or the rim strength of any article made from the coated

thermoplastic resin particles of the invention are improved. These improvements are particularly important if the article is a container for holding liquids and/or oily foods as discussed in the specification of the application. Claim 1 has also been amended to recite that the particles are used in forming an article and that the polyethylene wax improves at least the mechanical properties of the article.

The Cited Reference

Brenner et al. (WO 00/50511 equivalent to U.S. Patent No. 6,740,697) teaches a flame retardant thermoplastic molding composition containing an amorphous thermoplastic polymer, at least one flame retardant in the form of a fully or partially halogenated sulfonic acid salt and at least one alkaline earth metal sulfate and/or one oxide having an average particle size of up to 400nm. The amorphous thermoplastic molding compositions preferably are polycarbonates, however, they can include polyesters or polyolefins, which include polypropylene and amorphous polystyrenes (Column 9, lines 45-55 of '697 patent). Column 12, lines 37 to column 13, line 22 of the '697 patent state that the molding compositions may further comprise suitable additives such as a mold release agent such as zinc stearate, a lubricant such as polyolefin wax, and an antistatic agent such as polyethylene glycol, and that the total additive content of the molding composition is preferably from 0 to 20 wt.%, still more preferably 0 to 5 wt% based on the weight of the molding composition.

Column 13, line 26 - 30 of this reference states that the molding compositions may be prepared by mixing the respective constituents in a known manner and melt-compounding or melt-extruding in conventional units such as internal mixers, extruders and twin-screw units at

temperatures of from 200°C to 330°C. This explicitly teaches that the components of the molding compositions including the additives will be integrally mixed together through a melt procedure. The intention is to distribute the components of the thermoplastic molding composition including the additives throughout the thermoplastic composition and not on the surface of any particles. Therefore, the additives of this reference cannot be considered to a coating composition for any particles as taught by the invention. Moreover, the composition of this reference is not even formed into particles at the time these additives are added to the composition.

In the examples of this reference, it is illustrated that polycarbonate molding compositions including the additives are prepared by extruding the polycarbonate on a twin-screw extruder with the indicated quantities of additives followed by granulation. The granules are dried in a vacuum drying cabinet, and then are injection molded on an injection-molding machine at a melt temperature of 300°C to form test bars.

This reference teaches that the additives are first mixed into the molding composition to make them an integral part of the molding composition and then this molding composition is formed into granules. Contrary to this, the present invention involves already formed particles that are then coated with the coating composition of the invention and these particles are then formed into an article through a molding process.

This reference does not teach a coating composition as claimed in claim 1, which comprises three components, i.e. a) a liquid polyethylene glycol, b) a polyethylene wax having a particle size ranging from 6 to 140 microns and an average molecular weight of 650 to 30,000, and as recited in previously presented claim 48, a particle size

of 6 to 60 microns and an average molecular weight of 1,000, and c) a metal salt of higher fatty acid, and which coating composition improves both the resistance to leakage and the overall strength and/or the rim strength of the molded article produced from the coated thermoplastic particles.

This reference teaches a thermoplastic composition, preferably polycarbonates, which in addition to a flame retardant and an alkaline earth metal and/or an oxide may contain one or more additives which may be similar to the components of the coating composition of the invention, but which polymer, flame retardant, alkaline earth metal and/or oxide components and selected additives are integrally mixed together in a melt process to form an amorphous composition. This resultant amorphous composition is then used to manufacture solid plastic sheets or cellular sheets or multi-wall sheets, which are produced by extrusion or co-extrusion (Column 13, line 35 -40).

In view of the above novel distinctions of the claimed invention, Applicants respectfully request that the rejection of the claims under 35 U.S.C. 102 (b) be withdrawn.

The newly cited reference does not suggest the claimed invention of amended claim 1, whereby a coating composition consists essentially of a liquid polyethylene glycol, a polyethylene wax, and a metal of higher fatty acid, and wherein the polyethylene wax has a particle size ranging from 6 to 140 microns and an average molecular weight of 650 to 30,000. Furthermore, there is no suggestion in this cited reference for a coating composition consisting of these three components.

New Rejection

Applicants note that the arguments in the Amendment of September 22, 2005 with respect to the claims have been considered but are moot in view of the new grounds of rejection in view of the new reference, and that due to amendments and persuasive arguments by Applicants, the previous rejections of record based on Ikeda, et al., Sonnenberg et al., Hurley et al., Sakoda et al., and Imai et al. have been overcome and were withdrawn.

Summary and Conclusion

The claimed invention, particularly that of amended, independent claim 1 is not taught, disclosed, or suggested in the newly cited reference. Dependent claims 2, 18, 20-23, 25-26, and previously presented claim 48 are patentable on their own merits in addition to being directly or indirectly dependent on a patentable claim 1.

Applicants, for the first time, have found that the three components of the coating composition of claim 1 and the physical characteristics of the polyethylene wax are important for the suppression of permeation of liquids/foods and for the improvement of the overall strength and/or rim strength of molded articles, e.g. containers, e.g. cups made from the particles coated with the coating composition of the claimed invention.

Approval for debiting Applicants Account No. 501679 for this RCE application is enclosed.

The inventorship remains as originally indicated.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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